Remarks

The Office Action dated March 2, 2004 has been carefully reviewed and the foregoing amendment has been made in consequence thereof.

Claims 1-18 are pending in this application. Claims 1-18 stand rejected.

The objection to the disclosure is respectfully traversed.

Paragraph [0006] has been amended as suggested by the examiner.

Submitted for approval herewith is one replacement sheet of drawings containing new Figures 2 and 3. Figures 2 and 3 have been amended to show hydraulic control unit 78.

For the reasons set forth above, Applicants respectfully request that the objection to the disclosure be withdrawn.

The rejection of Claims 1-18 under 35 U.S.C. § 102(e) as being anticipated by Steiner et al. (US 6,650,722) is respectfully traversed.

Steiner et al. describe a transponder card for a nuclear reactor control rod drive control. The control system includes a control processor and a plurality of electrical devices operationally coupled to the control processor. The transponder card is configured to receive commands from the control processor, energize an appropriate electrical device when commanded, detect a failure in control circuitry of the transponder card, send a failure alarm, and remove power from an electrical device during a control circuitry failure event when there is no command to energize the electrical device.

Claim 1 of the present application recites a branch amplifier card for a nuclear reactor control rod drive control system. The control system includes a control processor, a plurality of transponder cards arranged in clusters with each cluster under the control of a branch amplifier

card. The branch amplifier card is configured to receive commands from the control processor, send the converted commands to transponder cards under the control of the branch amplifier card and to a downstream branch amplifier card, receive an acknowledge word from transponder cards under the control of the branch amplifier card, add AC voltage threshold level information about the transponder cards under the control of the branch amplifier card to the acknowledge word, permit transponder trouble information attached to the acknowledge word to remain in the acknowledge word, and resend the acknowledge word including the transponder trouble information to an upstream branch amplifier card.

Steiner et al. do not describe nor suggest a branch amplifier card as recited in Claim 1. Particularly, Steiner et al. do not describe nor suggest a branch amplifier card configured to add AC voltage threshold level information about the transponder cards under the control of the branch amplifier card to the acknowledge word, permit transponder trouble information attached to the acknowledge word to remain in the acknowledge word, and resend the acknowledge word including the transponder trouble information to an upstream branch amplifier card. Rather, Steiner et al. describe that "Branch amplifier card 74 serves, in part, to distribute command (CMD) words it receives from central rod processing circuitry 72 to transponder cards 76 within its cluster and to the next downstream branch amplifier card 74. In a reverse manner, acknowledge (ACK) words are routed within a cluster to the cluster's branch amplifier card 74. Each branch amplifier card 74, in turn, routes the ACK work to a branch amplifier card 74 further upstream and back to control processor 72." Steiner et al. do not describe nor suggest that the branch amplifier card is configured to add AC voltage threshold level information about the transponder cards under the control of the branch amplifier card to the acknowledge word.

The present application describes, in paragraph [0030] that "Branch amplifier card 74 generates two additional pieces of information in the form of two bits that are attached to the end of the ACK word from transponder cards 76 that are in the branch amplifier card's branch of transponder cards. . . . The first bit, or Pn bit is added to the ACK word to show when the AC voltage is greater than the threshold level of the negative half cycle of the AC waveform. The Pn bit is a logic "0" when the AC voltage is less than the negative threshold level and a logic "1" when the AC voltage is greater than the negative threshold value. The second bit, or Pp bit is added to the ACK word to show when the AC voltage is greater than the voltage threshold for the positive half cycle of the AC waveform. The Pp bit is a logic "0" when the AC voltage is less than the positive threshold level and a logic "1" when the AC voltage is greater than the positive threshold value."

Also, paragraph [0032] of the present application describes that "A configuration jumper determines how branch amplifier card 74 adds the Pn and Pp bits to the ACK word. Without the jumper installed, branch amplifier card 74 separately adds the Pn and the Pp bits in their appropriate location of the ACK word (see Figure 5). With the jumper installed, branch amplifier card 74 logically "ors" the Pn and Pp bits to form a PnPp bit. The PnPp bit is a logic "1" when the AC voltage is above the threshold values set by the Pn and Pp jumpers, for example, greater than +95 volts and greater than -95 volts (e.g., -96 volts). The PnPp bit occupies the location of the Pn bit when there is no configuration jumper installed. The Pp bit location is then used to pass through the transponder trouble bit Tt that is added to the ACK word by a transponder card 76 as described below (see Figure 6)."

Applicants submit that a comparison of the ACK word shown in Figure 5 or Figure 6 of the present application to the ACK word in Figure 5 of Steiner et al. shows that the branch amplifier card described by Steiner et al. is not configured to add AC voltage threshold level information about the transponder cards under the control of the branch amplifier card to the acknowledge word. Accordingly, Applicants submit that Claim 1 is patentable over Steiner et al.

Claims 2-6 depend from independent Claim 1. When the recitations of dependent Claims 2-6 are considered in combination with the recitations of Claim 1, Applicants respectfully submit that Claims 2-6 likewise are patentable over Steiner et al.

Independent Claim 7 of the present application recites a nuclear reactor control rod drive control system that includes a plurality of branch amplifier cards. Each branch amplifier card is configured to receive commands from the control processor, send the converted commands to transponder cards under the control of the branch amplifier card and to a downstream branch amplifier card, receive an acknowledge word from transponder cards under the control of the branch amplifier card, add AC voltage threshold level information about the transponder cards under the control of the branch amplifier card to the acknowledge word, permit transponder trouble information attached to the acknowledge word to remain in the acknowledge word, and resend the acknowledge word including the transponder trouble information to an upstream branch amplifier card.

Independent Claim 13 recites a nuclear reactor that includes a control rod drive control system having a plurality of branch amplifier cards. Each branch amplifier card is configured to receive commands from the control processor, send the converted commands to transponder cards under the control of the branch amplifier card and to a downstream branch amplifier card,

receive an acknowledge word from transponder cards under the control of the branch amplifier card, add AC voltage threshold level information about the transponder cards under the control of the branch amplifier card to the acknowledge word, permit transponder trouble information attached to the acknowledge word to remain in the acknowledge word, and resend the acknowledge word including the transponder trouble information to an upstream branch amplifier card.

Steiner et al. do not describe nor suggest a nuclear reactor control rod drive control system as recited in Claim 7 nor a nuclear reactor as recited in Claim 13. Particularly, and at least for the reasons explained above, Steiner et al do not describe nor suggest a branch amplifier card configured to add AC voltage threshold level information about the transponder cards under the control of the branch amplifier card to the acknowledge word, permit transponder trouble information attached to the acknowledge word to remain in the acknowledge word, and resend the acknowledge word including the transponder trouble information to an upstream branch amplifier card. Accordingly, Applicants submit that independnet Claims 7 and 13 are patentable over Steiner et al.

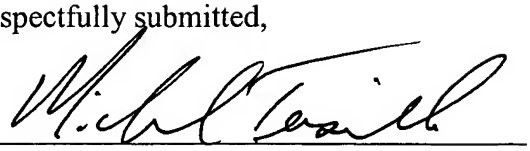
Claims 8-12 depend from independent Claim 7 and Claims 14-18 depend from independent Claim 13. When the recitations of dependent Claims 8-12 and 14-18 are considered in combination with the recitations of Claims 7 and 13 respectively, Applicants respectfully submit that Claims 8-12 and 14-18 likewise are patentable over Steiner et al.

For the reasons set forth above, Applicants respectfully request that the Section 102(e) rejection of Claims 1-18 be withdrawn.

In view of the foregoing amendments and remarks, all the claims now active in this

application are believed to be in condition for allowance. Favorable action is respectfully solicited.

Respectfully submitted,



Michael Tersillo
Registration No. 42,180
ARMSTRONG TEASDALE LLP
One Metropolitan Square, Suite 2600
St. Louis, Missouri 63102-2740
(314) 621-5070